MODULE-IV

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Concept of ethics – Professional ethics – ethical problems – provisions of a professional code – Role of professional bodies. Project management information system- Concept – Information system computerization – Acquiring a system – Problems in information system management - Benefits of computerized information system.

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CONCEPT OF ETHICS

Ethics

- Ethics is mainly known as the principle of moral conduct that makes a distinction between good and bad/ evil, right and wrong, virtue and non-virtue.
- The word ethics is derived from a Greek word '**Ethos**' meaning character.
- It is a branch of knowledge that governs right and wrong conducts and behaviours of an individual, profession, group or organization.
- It is a core of the professional and personal lives of people.
- A code of moral standards of conduct for what is "good" and "right" as opposed to what is "bad" or "wrong".

Ethical Behaviour

- It deals with what is "right" or "good" in the context of governing moral code.
- It is usually value driven.

Nature of Ethics

1. ***Scientific Nature:***
   - Ethics is a normative science which determines norms, moral values in a person and an individual's character.
   - It is a systematic explanation of what is right and what is wrong.
2. ***Not Art:***
   - Ethics is not art as art deals with the acquisition of skill to produce objects, while morality deals with motive, intention, purpose and choice which are considered right or wrong in the light of goodness.
3. ***Variable Nature:***
   - Ethics is not static.
   - It is not always the same.
   - Human beings change and the morality and ethical perspective in them also changes.

4. ***Exclusively for Human Beings:***
   - Ethics can only be applied to human beings as we are the ones who have the capacity for moral judgement.
   - We cannot expect ethical behaviour from animals, as they are not as intelligent as human beings are so ethics is exclusively for human beings.

Objectives of Ethics

Ethics is not compulsory in a person's life and it is not forced upon anyone but being ethical is one step forward towards being a good person.

The objectives of ethics are to study and assess human behaviour. It is also to establish principles and moral standards of behaviour.

Ethical objectives are based on the following factors:

- Objectivity
- Impartiality
- Accuracy
- Public Accountability
- Fairness
- Truthfulness

Importance of Ethics

- Ethics refers to society's sense of the right way of living our daily lives.
- It does this by establishing rules, principles, and values on which we can base our conduct.
- The purpose of ethics is to define acceptable human behaviour through knowing the types of actions, its consequences, and the limits of both humans and actions, as well as their acceptability.

Need of Ethics

- Ethics generally constitute:
  1) A system of moral principles by which human actions and proposals may be judged good or bad or right or wrong.
  2) The rules of conduct reorganized in respect of a particular class of human action.
  3) Moral principles as of an individual.

- Ethics serve as a guide to moral daily living and helps us judge whether our behaviour can be justified.
    1) Ethics guides us like a map
    2) Ethics is about feeling for others
    3) Ethical values creates integrity

Principles of Ethics

a) Honesty

b) Fairness

c) Fair Reward

d) Reliability

e) Integrity

f) Objectivity

g) Accountability

h) Truthfulness and confidentiality.

i) Autonomy and informed consent.

j) Beneficence.

k) Justice

Types of Ethics

There are 3 different types of

ethics. They are:

1) Meta-Ethics
2) Normative Ethics
3) Applied Ethics

1) Meta-Ethics:

Meta-ethics comprises the area of situational ethics and deals with logical questions like ‘What do we mean by ‘freedom’ and ‘determinism’ etc. It is the function of Meta ethics to define such vague concepts in ethical terms.

For example, a media critic’s description of a TV series as ‘good drama’ does not necessarily denote that the program is morally sound.

Some of the theories of Meta-Ethics are:

- Naturalism
- Non-Naturalism
- Emotivism and
- Prescriptivism

2) Normative Ethics:

Normative ethics deals with standards or norms by which we can judge human actions to be right or wrong. It deals with the criteria of what is morally right or wrong.

For example, if someone murders a person, everyone will agree that it is wrong. The question is: Why is it wrong to murder someone? There are a lot of different answers we could give, but if we want to specify a principle that stated why it's wrong, the answer might be: Murder is wrong because when we kill someone, we violate their right to live. Another perspective might be – To inflict unnecessary suffering on the person being murdered or their family is wrong, that's why to kill a person is wrong.

There are three elements emphasized by normative ethics:

- The person who performs the act (the agent)
- The act
- The consequences of the act

3) Applied Ethics:

- Applied ethics is the problem-solving branch of moral philosophy.
- It uses the insights derived from Meta ethics and the general principles and rules of normative ethics in addressing specific ethical issues and cases in a professional, disciplinary or practical field.
- Applied ethics is the vital link between theory and practice, the real test of ethical decision-making.
- Applied ethics often requires not only theoretical analysis but also practical and feasible solutions.
- Applied ethics takes into consideration issues such as abortion, euthanasia, capital punishment, drug decriminalization, gay marriage, etc.

Some of the key areas of applied ethics are:

- Bio Ethics
- Business Ethics
- Clinical Ethics
- Decision Ethics
- Organizational Ethics
- Professional Ethics
- Relational Ethics
- Social Ethics

Advantages of Ethical Behaviour in the workplace

- Builds Customer Loyalty
- Retains Good Employees
- Creates a Positive Work Environment
- Gets easier to Avoid Legal Problems
- Makes profit in the Long run

PROFESSIONAL ETHICS

Professional ethics is defined as the personal and corporate rules that govern behaviour within the context of a particular profession. Professional ethics are principles that govern the behaviour of a person or group in a business environment.

Professional Ethics-Types

a) Ideal Based Ethics-Character
b) Principle based Ethics-Rules, Codes, and Standards
c) Consequence Based Ethics-Outcomes

Importance of Professional Ethics

- Professional ethics establishes a baseline for common decency, respect, fairness, and integrity in given business area.
- It provides a basis for positive and shared expectations about the nature of products

and services.

- Professional ethics encompass the personal and corporate standards of behaviour expected of professionals.

Components of Professional Ethics

1) Honesty
2) Integrity
3) Transparency
4) Accountability
5) Confidentiality
6) Objectivity
7) Respectfulness
8) Obedience to the Law and
9) Loyalty

1) Honesty

- Honesty refers to a facet of moral character and denotes positive, virtuous attributes such as integrity, truthfulness, and straightforwardness along with the absence of lying, cheating, or theft.

2) Integrity

- Integrity is a concept of consistency of actions, values, methods, measures, principles, expectations, and outcomes.
- Integrity can be regarded as the opposite of hypocrisy, that it regards internal consistency as a virtue.
- The word "integrity" derived from the Latin adjective integer that means “wholeness”.

3) Transparency

- Transparency is a general quality.
- It is implemented by a set of policies, practices and procedures.
- It allow citizens to have accessibility, usability, utility, understandability, informativeness and auditability of information and process held by centers of authority (society or organizations).

4) Accountability

- Accountability is often used synonymously with such concepts as answerability,

blameworthiness, liability, and other terms associated with the expectation of account-giving.

- It is the acknowledgment and assumption of responsibility for actions, products, decisions, and policies and be answerable for resulting consequences.
- It cannot exist without proper accounting practices.

Accountability Fields:

a) Political accountability
b) Ethical accountability
c) Accountability in administration & education.
d) Individual accountability
e) Constituency relations
f) Public/private overlap

5) Confidentiality

- Confidentiality is an ethical principle of discretion associated with the professions, such as medicine, law, psychotherapy.
- In law, and mediation, there exist communications between the client and the professional, which are "privileged" communications.
- In business, the confidentiality of information, a mainstream adaptation of the "need to know"
- In military, it is basic to the security of corporate information.
- Confidentiality regarding:
    a) Whose interests.
    b) Which interests

- Confidential information of:
    a) Worker
    b) Employer
    c) Colleague
    d) Competitor

6) Objectivity

- Objectivity is a principle of journalistic professionalism.
- In journalism, objectivity may synonymous with neutrality.
- Objectivity in journalism enables highly accelerated news reporting and delivery, which sometimes is at tension with standards of objectivity.

7) Respectfulness

- Respect gives a positive feeling of esteem for a person and conduct representative of that esteem.
- Respect can be a specific feeling of regard for the actual qualities of the one respected.
- Rude conduct is usually considered to indicate a lack of respect, disrespect, whereas actions that honor somebody or something indicate respect.
- The opposite of respect is contempt.

Language:

- Respect is shown in many languages such as:
- An honorific is a word or expression.
- An anti-honorific forms.
- A Style is a legal, official, or recognized.

Hand gesture:

- When a person's foot accidentally touches a book or any written material
- This also counts for money, which is considered as a manifestation of the goddess of wealth-"Lakshmi"

8) Obedience to law

- Law is the set of enforced rules under which a society is governed.
- Law is one of the most basic social institutions-and one of the most necessary.
- The law thus establishes the rules that define a person's rights and obligations.
- The law also sets penalties for people who violate these rules.
- In fact, laws frequently are changed to reflect changes in a society's needs and attitudes.
- Law is a system of rules and guidelines which are enforced through social institutions to

govern behaviour.

- The formation of laws themselves may be influenced by a constitution (written or unwritten)
- The law shapes politics, economics and society in countless ways and serves as a social mediator of relations between people
- Legal subjects
- Legal systems:
    - ✓ International law
    - ✓ Civil law
    - ✓ Constitutional, Common law and administrative law equity
    - ✓ Criminal law
    - ✓ Religious law
    - ✓ Contract law
    - ✓ Tort law
    - ✓ Property law
    - ✓ Equity and trusts

"Whistleblowing"

- A whistleblower is a person who tells the public or someone in authority about alleged dishonest or illegal activities occurring in a government department or private company or organization.
- A whistleblower is a person who raises concern about frauds, corruptions, wrongdoings and mismanagement.
- A government employee who exposes corruption practices within his department is a whistleblower.

The misconduct can be classified in several ways, such as:

a) Violation of Indian laws.
b) Posing direct threat to public interest (Fraud, corruption)
c) Violation of health or safety norms.
d) Deceptive practices

DIMENSIONS OF ETHICS (3 "R's" of Ethics)

1) Rules
2) Responsibility
3) Respect

ETHICS IN CONSTRUCTION

- In the construction industry, ethics has developed both at a professional and organizational level.
- The increasing emphasis on sustainability and environment in construction further requires companies to apply ethical standards to their activities.
- The engineer should contribute to the development of the nation and the promotion of human welfare through their professional knowledge.
  - ✓ He/she should honour human life without discriminating against cast, creed, social position and religion.
  - ✓ He/she should serve the society and should not have any intention adverse to the national development and public welfare.
  - ✓ He/she should hold paramount the safety, health and welfare of the public in performance of their professional duties.
- The engineer should aim at development of technology and should strive to improve his/her techniques and put the results into wide practice.
  - ✓ He/she should continue their professional development in research field and practical utilization throughout their careers, and should contribute to the engineering society through publication of results.
  - ✓ He/she should evaluate the works of his/her colleagues in the same way as he/she wants to be evaluated himself/herself.
- The engineer should support the professional and technical societies of his/her disciplines.
- The engineer should issue public statements only in an objective and truthful manner.
  - ✓ He/she should act according to well-balanced reasoning as regards their social, ecological and economic responsibilities.
- The engineer should act in a manner to uphold and enhance the honour, integrity and dignity of the engineering profession above the economic advantages.

- ✓ He/she should not make excessive design or excessive cost-cutting at the cost of safety.
- ✓ He/she should not damage the prestige of the profession.

- The engineer should be honest, impartial and should not behave suspiciously.
  - ✓ He/she should avoid associating himself/herself with dubious work or lending his/her name to such work.
  - ✓ He/she should perform services only in areas of their competence.

Principles in Ethics of Construction

1) Honesty
2) Fairness
3) Fair reward
4) Reliability
5) Integrity
6) Objectivity
7) Accountability

ETHICAL PROBLEMS /PROBLEMS ENCOUNTERED IN CONSTRUCTION WORKS

Some of the common ethical problems encountered in Civil Engineering Works are:

1) Cover Pricing
2) Bid Cutting
3) Poor Documentation
4) Late and Short Payments
5) Subcontractors' Lack of Safety Ethics
6) Unfair Treatment of Contractors In Tender/Final Account Negotiations
7) Competitors' Overstatement of Capacity and Qualifications to Secure Work
8) Competitors' Falsification of Experience and Qualifications
9) Bureaucratic-Government Policy
10) Conflict of Interest

11) Fraud and Bribery

PROVISIONS OF A PROFESSIONAL CODE

- A code of ethics prescribes how professionals are to pursue their common ideal so that each may do the best she can at a minimal cost to herself and those she cares about (including the public)
- The code is to protect each professional from certain pressures (for example, the pressure to cut corners to save money) by making it reasonably likely (and more likely than otherwise) that most other members of the profession will not take advantage of her good conduct.

CODE OF ETHICS AND PROFESSIONAL CONDUCT

1. ***Be inclusive:***

   We welcome and support people of all backgrounds and identities. This includes, but is not limited to members of any sexual orientation, gender identity and expression, race, ethnicity, culture, national origin, social and economic class, educational level, color, immigration status, sex, age, size, family status, political belief, religion, and mental and physical ability.

2. ***Be considerate:***

   We all depend on each other to produce the best work we can as a company. Your decisions will affect clients and colleagues, and you should take those consequences into account when making decisions.

3. ***Be respectful:***

   We won't all agree all the time, but disagreement is no excuse for disrespectful behavior. We will all experience frustration from time to time, but we cannot allow that frustration become personal attacks. An environment where people feel uncomfortable or threatened is not a productive or creative one.

4. ***Choose your words carefully:***

   Always conduct yourself professionally. Be kind to others. Do not insult or put down others.

   Harassment and exclusionary behavior aren't acceptable.

This includes:

a) Threats of violence.
b) Insubordination.
c) Discriminatory jokes and language.
d) Sharing sexually explicit or violent material via electronic devices or other means.
e) Personal insults, especially those using racist or sexist terms.
f) Unwelcome sexual attention.
g) Advocating for, or encouraging, any of the above behavior

5. ***Don't harass:***

In general, if someone asks you to stop something, then stop. When we disagree, try to understand why. Differences of opinion and disagreements are mostly unavoidable. What is important is that we resolve disagreements and differing views constructively.

6. ***Make differences into strengths:***

We can find strength in diversity. Different people have different perspectives on issues, and that can be valuable for solving problems or generating new ideas. Being unable tounderstand why someone holds a viewpoint doesn't mean that they're wrong. Don't forget that we all make mistakes and blaming each other doesn't get us anywhere. Instead, focus on resolving issues and learning from mistakes.

Below are some common provisions found in organizational codes

Compliance, Integrity and Anticorruption**:**	• Accuracy of corporate finances and financial reporting. • Employee records and expense reports • Bribes • Political contributions
Conflicts of Interest	• Gifts and gratuities • Political activity • Outside employment • Family members • Disclosure of financial interests
Employee, Client and Vendor Information	• Maintaining records and information • Privacy and confidentiality • Disclosure of information

Employment Practice	• Workplace harassment • Equal opportunity • Diversity • Fair treatment of staff • Work-family balance • Discrimination • Fair labor practices • Illegal drugs and alcohol • Use of organization property and resources • Proper exercise of authority • Employee volunteer activities • Romantic relationships with coworkers • Incentives and recognition systems
Environmental Issues	• Commitment to the sustainability • Employee health and safety
Ethics and Compliance Resources	• Ethics advice helpline • Reporting procedures • Anonymous/confidential reporting hotline • Summary of investigations process • Anti-retaliation policy and protections for reporters • Accountability and discipline for violators
Internet, social networking and social media	• Internet and social network use at work • Prohibited sites and content • Policies regarding posts about company, work products or coworkers • Online relationships between managers and their reports
Relationships with third parties	• Procurement • Negotiating contracts

ROLE OF PROFESSIONAL BODIES

Professional bodies are organizations whose members are individual professionals. In some professions it is compulsory to be a member of the professional body, in others it is not. This usually depends on whether or not the profession requires the professional to have a 'license to

practice', or to be on a professional register, in order to do their job. This is related to how the profession is regulated i.e. who is responsible for making sure that professionals are doing their jobs properly.

Functions of a Professional Body:

1. Set and assess professional examinations
2. Provide support for continuing professional development through learning opportunities and tools for recording and planning
3. Publish professional journals or magazines
4. Provide networks for professionals to meet and discuss their field of expertise
5. Issue a code of conduct to guide professional behaviour
6. Deal with complaints against professionals and implement disciplinary procedures
7. Enables fairer access to the professions
8. Find out more at our fair access section.
9. Provide careers support and opportunities for students, graduates and people already working.

CODES OF ETHICS

- The primary aspect of codes of ethics is to provide the basic framework for ethical judgment for a professional.
- The codes of ethics are guidelines for specific group of professionals to help them perform their roles, to know how to conduct themselves, and to know how to resolve various ethical issues.
- The codes of ethics help the professionals to apply moral and ethical principles to the specific situations encountered in professional practice.
- These codes convey the rights, duties, and obligations of the members of the profession.

POSITIVE ROLES OF CODES OF ETHICS

1) Inspiration
2) Guidance
3) Support for responsible conduct

4) Deterring and disciplining unethical professional conduct
5) Education and promoting of mutual understanding
6) Contributing to a positive public image of the profession
7) Protecting the status quo and suppressing dissent within the profession
8) Promoting business interests through restraint of trade

1) Inspiration

- Ethical codes provide a positive inspiration for the professionals to exercise their obligations effectively.
- These codes inspire the engineers to apply moral principles under the various conflicting situations.

2) Guidance

- The ethical codes provide guidelines for achieving the obligations of professionals.
- These codes also provide specific guidelines, which tell how to apply the code to the unique situations.

3) Support

- The ethical codes offer positive and potential support to engineers to perform their duties in ethical manner.
- At times, the codes can serve as legal support for those engineers who are tangled in professional obligations and conflicts.

4) Deterrence and Discipline

- The ethical codes can be used for deterring and disciplining unethical professional conduct.
- These codes are also considered as the formal basis for investigating unethical conduct

5) Education and Mutual Understanding

- The ethical codes can be used in educational institutions and other places for emphasizing the importance of moral issues and values.
- They are also useful to encourage a shared understanding among professionals, the public and government organizations concerning the moral responsibilities of

engineers.

6) ***Contributing to the Profession's Public Image***

- The ethical codes can confer a positive image to the public of an ethically committed profession.
- The codes enable the engineers to serve the public more effectively

7) ***Protecting the Status***

- The codes institute ethical conventions. These ethical conventions can promote a minimum, acceptable level of ethical conduct.
- The codes can also suppress the dispute within the profession.

8) ***Promoting Business Interests***

- The codes of ethics promote business interests through restraint of trade.
- They help in facilitating morally feasible business dealings to the professionals.

Limitations of Codes of Ethics

- Codes of ethics are broad guidelines, restricted to general phrases.
- The codes cannot be applied directly to all situations.
- Engineering codes often have internal conflicts, since several entries in codes overlap with each other, which may result in moral dilemmas.
- The codes cannot serve as the final moral authority for professional conduct.

PROJECT MANAGEMENT INFORMATION SYSTEM (PMIS)

- PMIS needs information to make decisions. Some people use the terms data and information synonymously. But technically they are different. Data refers to raw, unsummarised and unanalysed inputs. Managers do not need loads of input data generated in the control process. It is the information extracted from the data that helps the managers in performing their functions efficiently and effectively.
- An information system is a set of inter related part operating together for the decision making. In construction project, information system is for making appropriate decision speedy.
- An effective PMIS can improve managerial efficiency & effectiveness in construction

project.

Concept of PMIS

- PMIS is an integrated user machine system that provides information to support operations management and decision making function relating to planning and control of project objectives.
- Project Management Information System (PMIS) are system tools and techniques used in project management to deliver information.
- A project management information system (PMIS) is the information required for an organization to execute projects successfully.
- A PMIS is typically one or more software applications and a methodical process for collecting and using project information.
- PMIS Covers the information related to planning and controlling of the cost, resources, scope and time of a project.

Objectives of PMIS

- To compare the baseline with the actual completion of activity.
- To manage materials
- To collect financial data
- To keep a record for reporting purposes

PMIS-Information Sources

1. Internal Sources:

Updated baseline plans, formal and informal reports by project teams, information from Quality Management, HRD Management, Communication Management etc.,

2. External Sources:

Government Policy, Research Publications, Commercial Journals, industry magazines, academic journals, websites etc.

PMIS involving in Developing:

- The framework
- Establishing baselines and standards for monitoring performance.
- Retrieving information from monitored data.
- Economically capturing and processing monitored data
- Communicating the information to right individuals.
- Storing the relavant information documents.
- Protecting the stored information.
- Managing the information resources.

Functions of PMIS

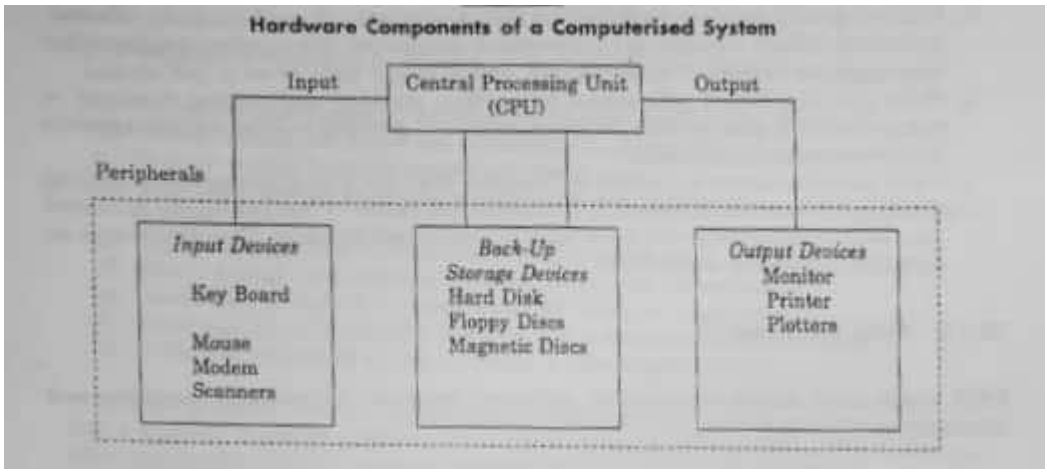
- Project Management Information System (PMIS) is used by upper and lower management to communicate with each other.
- Project Management Information System (PMIS) helps in planning, executing and closing project management goals.
- During the planning process, project managers use PMIS for budget framework such as estimating costs.
- PMIS provides managers with the decision-making support needed in planning, organizing, and controlling projects.
- To set standards to measure & compare progress and cost.
- To convert data from operations in to information.
- To organize efficient means of quantifying data.
- To report the correct and necessary information.
- To deliver the information on time for remedial / corrective actions.

COMPONENTS OF PMIS

PMIS components comprise hardware, software, database, procedures, operators and documents.

Hardware

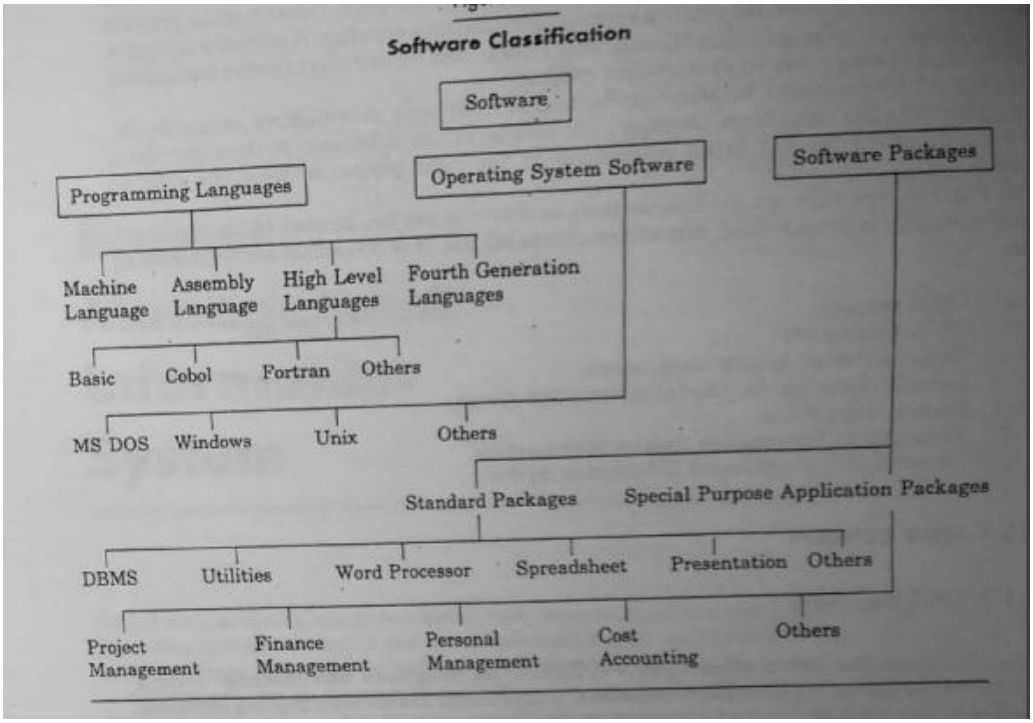
The term hardware covers all the electronics and electro-mechanical equipment used in computerized data processing systems. This equipment consist of the Central Processing Unit (CPU) and its peripherals. Peripherals are the externally connected decision of the computer such as input devices, storage disks and output devices. The hardware components of a computerized system are shown in Fig



Software

Computer hardware needs proper instructions to perform specified operations .These instructions are communicated to the computer by the prngramzrer or user) in the form of a programme. These source programmes are written for a particular purpose in a predetermined manner using an appropriate computer language. These programmes are then translated by the computer's in-built system into object programmes or a set of instructions expressed in the machine's language. The CPU understands and processes these instructions with the operating systems to perform specified functions All these operating procedures and instructions in a computerized system are grouped under the term 'software'. Broadly, the term software covers whatever is necessary to generate instructions with a view to operate the system's hardware as per the programmer's requirements.

A schematic diagram showing further subdivisions of the types of softwares is shown in Fig.



Database

The database contains all data utihzed by models and application softwares. An individual set of stored data is often referred to as a file.

Procedure

Formal operating procedures are physical components because they exist in a physical form such as a manual or an instruction booklet

Operators

These include computer operators, system analysts, programmers, data preparation personnel, information system management, data administrators, etc.

Documents

These consist of processing transactions, master files, reports, process enquires,output,etc.

THE STRUCTURE OF PMIS

PMIS can be structured according to information needs of managerial planning and control activities, or these can be based on organizational functions or a combination of both. The areas of managerial planning and control activities can be divided into three categories,

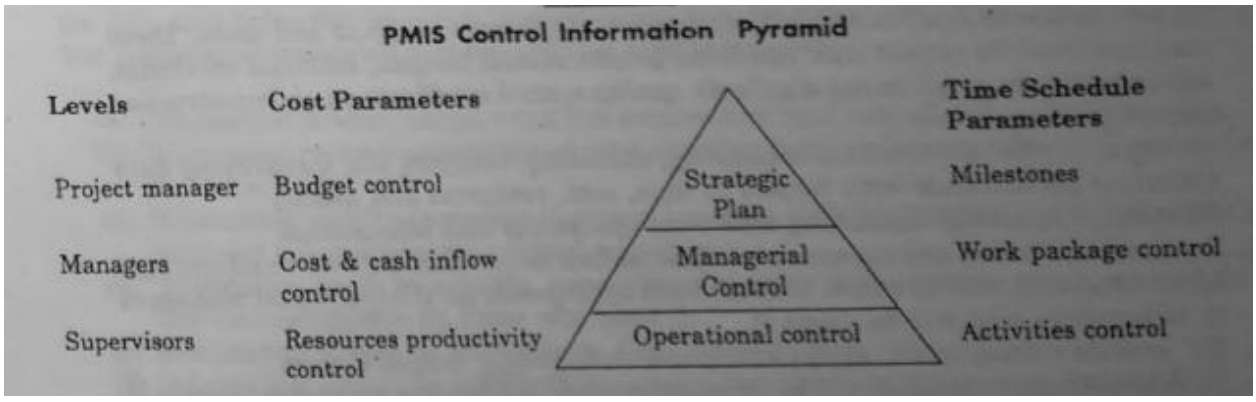
- strategic planning,
- management control and
- operational control.

Strategic planning is the process of deciding the long term plan for achieving the project objectives.

Management control is the process by which managers ensure that the assigned resources are used efficiently and effectively to accomplish the assigned targets.

Operational control aims to minimize wastage in resource utilization.

The PMIS structure for managing planning and control activities resembles a pyramid. The information System aims to provide appropriate information at various levels of management for managing the assigned functions. The bottom level contains information pertaining to transaction processing at the operation level, like the activity progress status or its resource productivity. The second level consists of information necessary at the responsibility centre/managerial- level for operational planning, decision making and controlling assigned objectives. The top level consists of information necessary to support strategic planning at the project/corporate level (top management level. It may be noted that information generated at the tower level is processed to derive information for the next higher level. Managerial planning and controlling activity levels are depicted in Fig



PMIS FRAMEWORK

The information system supporting project management can be broadly categorized into five subsystems These are

a) Data processing system for operation and managerial levels.
b) Decision support system for managerial and top-level.
c) Office information system for office and general purpose applications.

d) The artificial intelligence based system for top level.

e) Communication system for coordination at all levels

The above classification is not rigid and these subsystems blend together in providing information. Further, a system may be composed of any one or a combination of the above five subsystems.

a) Data Processing System

Using computers, the data processing system, speedily performs the three main accounting functions-

- ✓ book-keeping,
- ✓ issuance and
- ✓ control reports.

(a) *Book keeping* includirg gathering arid recording data.

(b*) Issuance* of routine documents such as invoices, pay cheques and reminders. The process includes sorting, comparing, storing, retrieving, displaying and printing.

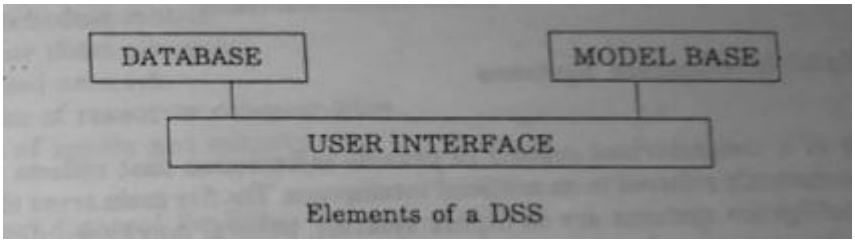
(c) *Control reports* of operations are by-products of routine transactions. Control reports provide pre-formatted type of information, generally used for structured types of decisions. Its focus is to supply relevant information to decision-makers on pre-formatted hard copy schedule reports, exception reports and on-demand reports. It also retrieves information as and when required.

Data control process inputs are the data captured from transactions in responsibility centres. The input data is either processed periodically as a batch or is updated on real-time occurrence. Data is stored in files and control report is given to the appropriate person. It helps in running the project smoothly by automatically processing voluminous data. Its output is in the form of documents such as pay cheques, invoices, periodic reports, reminders and the management control reports .

b) Decision support systems

Decision support systems present information in such a way that managers can conveniently use it to take a structured decisions. With the rapid advancement and interactive technology, micro computing and menu-driven application software the information technology has now provided complete solutions to managerial decision-making needs in semi-structured situations. The decision support systems provide support to the managers to extend their decision making capabilities. The DSS considers all the important aspects of a situation systematically and provides an orderly means of recording and presenting information to the decision maker. The Executive support system(

ESS) is similar to DSS and is designed to meet the strategic planning information needs of top executives in the organization hierarchy.



Elements of a DSS

c) Office Information Systems

The primary purpose of Office Information Systems is to facilitate speedy communication within the project and between project office and corporate office, An office information system includes many types of computer based technologies. These include office documentation management system, message handling system, teleconferencing system and office support system. The technology is used in this is systems are.

Document Management Systems	Word processing Desktop publishing Photocopiers Projectors Archival storage
Message transmission systems	Electronic mail Telephones Facsimile
Teleconferencing system	Audio conferencing Video conferencing Computer conferencing
Office support system	Desktop organizer Computer aided design Presentation graphics Close circuit television

d) Artificial intelligence systems

The capability of a computerized system to provide information that reflects human-like intelligence is commonly referred to as artificial intelligence. The five main areas of application of artificial intelligence systems are :

- ✓ Expert systems
- ✓ Natural language interface
- ✓ Vision systems
- ✓ Robotics and
- ✓ Neural network.

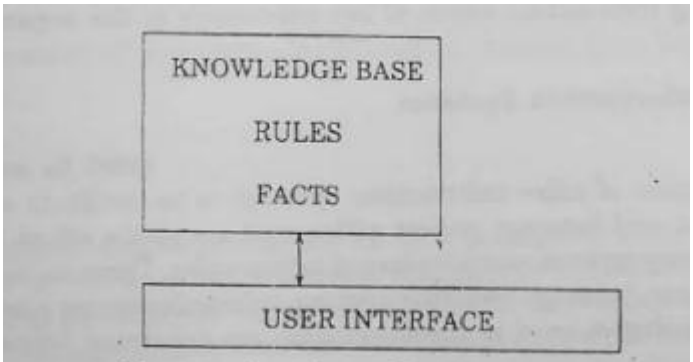
Expert system software imitates the reasoning process of experts and provides decision-makers with advice on similar problem solving.

Natural language systems use computers to communicate with users in different languages .

Vision systems use computers to perform tasks like updating 3D images which can only be done through the use of the human eye.

Robot based computerized system use devices that mimic the motor activity of a human being.

Neural networks are like our knowledge based computer system that emulates the human brain activity such as detection of a fraud, risk and trends.



Elements of an Expert System

e) Information Communication

Telecommunications and information technology is fast reducing communication barriers. Managers can have relatively faster access to the databases, whether centralized or distributed. Not only is information access faster but everyone can obtain up-to-date data, and post their own inputs for others to use without delay. Information can be shared among various groups working at the same geographical site by LAN (Local Area Network). The data may be maintained on a central computer (Server) and accessed and updated by users from different terminals (Clients). Terminals at different sites may be connected to the LAN through modems and communication lines. This

makes the information accessible and easy-to.update from remote locations.

LAN's at different sites may be connected with each other through WAN's (Wide Area Networks). In such systems, part of the information may be held centrally and part may be handled only at the LAN at site. Internet, a large area network with open distribution system now offers facilities for disseminating information over geographically dispersed areas. It is basically being used for the following:

- ✓ Electronic mail
- ✓ Group discussions—Users networking
- ✓ Long distance programming and data access
- ✓ Fi1e transfers

INFORMATION SYSTEM COMPUTERIZATION

- Either can make or buy software applications.
- Manufacturing software applications are time consuming.
- Buying software applications has following advantages:
  1) Rapidly installed.
  2) Low risk
  3) Low cost
- Project Management system package have the facilities & operating features.

1) Plan Creating Facility

- Input gives printable typical graphs
- Networks, Bar charts, Time scaled networks, Histogram, Schedule matrix, Forecast of Input & output.

2) Project control Facility

- These are typical performance report which are easy to read and on the spot information are available.
- Eg: Time control report, Resource control report, Cost control report, Project Data Report.

(a) Time control report

- ✓ Actual vs planned bar chart schedules and time analysed network reports
- ✓ Activity status reports with early and scheduled starting and completion dates for current and balance activities and floats
- ✓ Activity reports generated by department, resources, costs and sales

(b) Resource control reports

- ✓ Actual vs planned resources by activity, work package, resources(men, materials and equipment), departments.

- ✓ Resource productivity analyses report by activities, work package, resources departments.
- ✓ Histograms of resources and forecasts for planned, actual and balance work
- ✓ Optimum schedules of resources by varying resource availability patterns

(c) Cost control reports

- ✓ Actual and budgeted cost variences by activity, work package, resources department.
- ✓ Cost performance analyses by activity, work package, resources department.
- ✓ Sales value of work done and balance work by activity, work package, resources , BOQ department
- ✓ Planned vs actual costs and sales forecast and future trends.
- ✓ Monthly progress payment invoices

(d) Project data records

- ✓ Men, materials and equipment status report
- ✓ Financial status reports
- ✓ Project costs status reports

3) Criteria to computerized planning and control system

(Choice between manual and computer based project)

- ✓ Network size and complexity-

  Simple projects containing less than 200 activities unless required to be frequently monitored. do not need a computerized system. Use of computerized system is desirable for projects having more than 200 activities.
- ✓ Duration-Time unit of activities

  Generally, activities having a duration time unit greater than weeks can be handled manually unless the project life span is spread over a number of years, say more than three years
- ✓ Frequency of Updating-

  In case of a complex project where the duration of activities is normally less than 1% of total project duration and monitoring is weekly done or randomly, computerization of project management system as advisable In particular projects where quarterly monitored

need not to be computerized.

- ✓ Other Considerations-Weakly progress will be updated, output to be frequently printed to the client, update information frequently.

4) <u>Acquiring a System</u>

a) Choosing software
   - ✓ Package preview- Software selection is a time-consuming process and each software package may take about half a day's time to go through. The aim of the previewing is to shortlist two to three out of available software packages which come close to users specification.
   - ✓ Operation evaluation - The shortlisted packages are evaluated for their operational features to find the best fit. This evaluation is based on Critical examination of the essential features.
   - ✓ Demonstration- At the selection stage the demonstration of the package preferably using the proposed hardware, can give a fair idea of working of the system and its capabilities The demonstration can be arranged to buy the supplier at his location or at a place where the software has already been installed by the supplier.

b) Matching hardware with software
   - ✓ Scrutinizing processor capability
   - ✓ RAM &ROM memories
   - ✓ Video Display Units
   - ✓ Key boards
   - ✓ Power
   - ✓ Back up storage
   - ✓ Printers

c) Training

d) System Cost
   - ✓ Equipment Cost
   - ✓ Installation Cost
   - ✓ Operating Cost
   - ✓ Computer Room

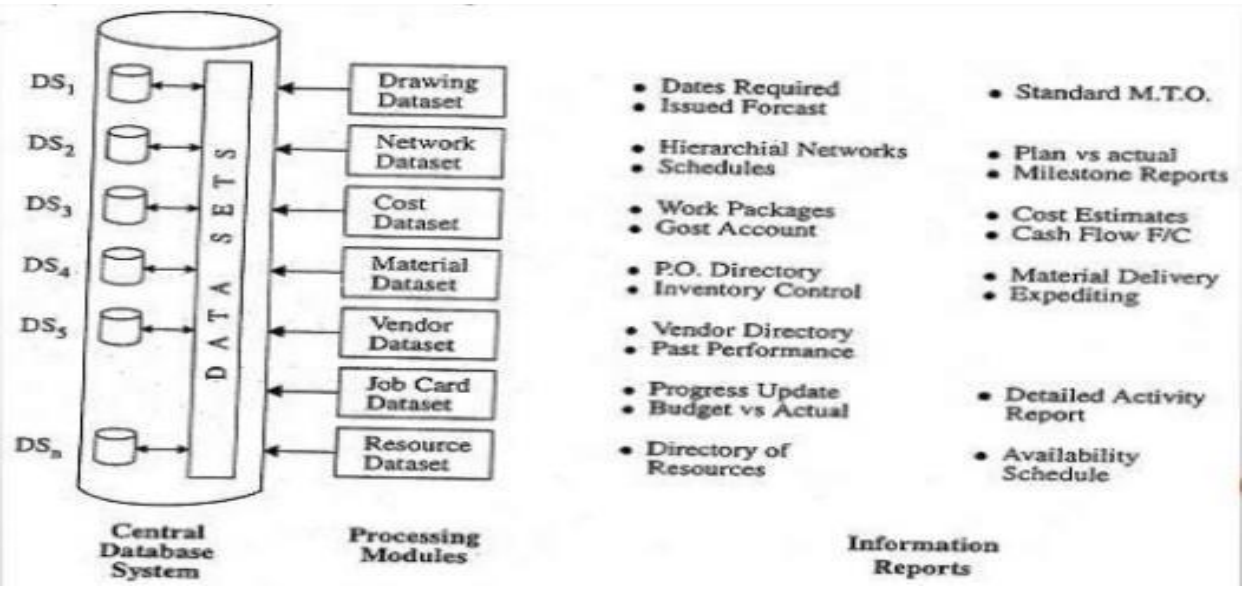
e) Selecting Supplier

INTEGRATED PMIS

- Integrated project management is the collection of processes that ensure whether the various elements of projects are properly coordinated.
- It establishes and manages the involvement of all relevant stakeholders and resources, according to organization's set of standard processes.
- Integrated project management information system allows total project information to be structured into a number of data sets which are integrated by the software
- Some of the relevant datasets for a large project are:

1. Network dataset
2. Drawing data set
3. Cost dataset
4. Material dataset
5. Vendor dataset
6. Job card dataset
7. Rates dataset
8. Resources dataset
9. History dataset etc.

STRUCTURE OF AN INTEGRATED PMIS



- Integration of these independent datasets through various processing modules enables high control of projects.
- Integrated PMIS allows both Horizontal integration and Vertical integration.

1) Horizontal integration between disciplines such as cost-schedule integration, cost estimates, cost accounts and project schedule integration through Work Breakdown Structure
2) Vertical integration: For producing desired summary reports, data can be aggregated to any required level.

ADVANTAGES OF PMIS

a) Enables transparency in decision making
b) Monitors documents and stores information for the present and future use.
c) Improves the efficiency
d) Reduces paper work, generates quick reports
e) Generates data regarding time, cost, resources, quality and risk planning
f) Improves services to stake holders.

BENEFITS OF COMPUTERIZED INFORMATION SYSTEM

1) It can handle unlimited activities.
2) Generates all types of Graphs
3) Update the progress
4) Can add, modify, and delete activities or resources.
5) Multi user Operation facility and interface with other software.
6) Easy to learn and operate
7) User friendly.

PROBLEMS IN INFORMATION SYSTEM MANAGEMENT/ PROBLEMS IN PMIS

A. System Organization Problems

The major information problems existing in most of the organizations can be classified as:

1) **Managers do not know what they need**

The information needs of managers varies with the level at which they are operating and the function within which they are operating. Very few organizations have made a conscious and deliberate effort to identify specific information needs of various managerial positions. Generally, there exists a gap between what information a manager thinks should be made available to him and what is actually made available to him. Consequently, there is a tendency to store every element of

data, in many media like photocopy, hard copy, floppies, magnetic tapes, compact disks, optical disks, hard disks and microfilms, Unless properly controlled, acquiring and storing large amount of information is a costly process.

2) Information s not easily retrieveable

Some projects do generate useful and necessary data, but often in a form or location that makes it uneconomical and unfeasible to retrieve. This might lead to a wastage of effort, if such information cannot be accessed, information can go out of control when it is held in different media, using different softwares. These could be froth different sources and of various levels, and languages, and stored at different locations

3. Information can get misinterpreted

This problem arises due to different sources within the organization or due to excessive pressure on the source to collect information. It leads to poor and ineffective decision making, specially when information is not read in the proper context. Misunderstood information can have a negative effect

4. Information 'accumulation' is common

This is caused due to a system having grown with the growth and diversification of the organization. At times, people tend to make extra copies just in case it gets lost. This duplication adds to the costs of producing, filing, storing and retrieving information. The sheer volume of data makes it impossible to be consistently accurate and reliable Overloads cause major communication problems.

5. Some people hide information

They are reluctant to share it with others so as to remain indispensable.

6. There is a resistance to change

Some people do not easily shed old methods and keep face with fast changing new technology Some are reluctant to witness the obsolescence of their skills.

7. Information delays are common

There is a time-lag between the occurrence of an event and the information reaching the concerned person. At times, data is not moved and processed fast enough to allow enough time for managers to react quickly and in time. Several times, data are no longer of any value when they are made available to them.

8. Information systems are of little use to construction man

In practice the paper work at site level does not change. Further, the site managers manage

construction by walking around rather than siting with a desktop. PMIS and the PC's may help the functional managers but do not prove very useful for the construction manages who can see most of the relevant information on ground with naked eye. This may lead to an unnecessary conflict between the site mannager and the MIS personnel.

9. Information systems cost money

But most of the time, the installed equipment is not fully utilized. Moreover, with the rapid advancement in information technology, money spent on equipment which soon becomes obsolete is often questioned.

If projects are not to be bogged down by these problems, it is imperative that the project management make a deliberate and conscious effort to manage their information by setting up an effective PMIS.

B. System Acquisition and Implementation Problems

The procurement and installation of a computerized system is not trouble free.

However, the following guidelines can minimize these difficulties:

- ✓ Acquiring a computerized system needs extra effort and is a time-consuming process. It should be treated as a project in itself.
- ✓ People do not know what they want until they get what they do not want It is therefore necessary that the functional requirements of the computerized system be crystallized at the feasibility stage.
- ✓ Success of the system depends upon the suppliers' support. Therefore, the supplier should be chosen after a thorough scrutiny.
- ✓ Scrutinize the system carefully before purchasing. The end results should not be that the patient died but the operation was successful.
- ✓ The initial 90 per cent of system installation costs are incurred within 10 per cent of the time of installation but it is the last 10 per cent of installation and commissioning that becomes tricky and time consuming.
- ✓ Do not give up if the system does not function properly in the beginning. 1f anything can go wrong, it will. There will be problems and a few problems are not the same thing as failure.
- ✓ Job training on the installed system will instill confidence Detailed study of manuals may reveal the extra facilities, which the trainee may not have thought of earlier

- ✓ Test the system thoroughly after installation by running it with known inputs and outputs It will lead confidence in the machine and may reveal hither-to-unnoticed exceptions in the system.
- ✓ Keep a-ll concerned informed about the progress of computerization at regular intervals, before, during and after the system is installed. This will save your time in answering frequent enquiries from people.

C. Management Role in Problem Solving

- ✓ Management should treat information as a resource requiring proper management, like money. manpower machinery and materials.
- ✓ Management should appoint a monitor for information system.
- ✓ The monitor should be assigned specific responsibility for planning and coordination,if not direct control, of the use of the following:
    - Information handling skills
    - Information technology
    - Information sources and stores.
- ✓ All expenditure on information systems and resources should be centrally coordinated
- ✓ The monitor should keep abreast with new developments that can contribute to the better management of information resources.